

**CLAIMS****What is claimed:**

1. A medical pad, comprising:

5 a fluid containing layer for containing a thermal exchange fluid circulated therethrough, wherein said medical pad is operable for thermal exchange with a patient through a first side of said fluid containing layer; and,

an external electrode interconnected to said fluid containing layer on said first side thereof.

2. A medical pad as recited in Claim 1, further comprising:

10 an electrical connector electrically connected to said external electrode and extending through said fluid containing layer to a second side thereof.

3. A medical pad as recited in Claim 2, said electrical connector comprising:

a port for electrical interconnection to a signal cable.

4. A medical pad as recited in Claim 2, wherein said electrical connector

15 extends through said second side of said fluid containing layer at an exit location within a predetermined area having open-access when said medical pad is positioned on a patient in a predetermined manner.

5. A medical pad as recited in Claim 4, wherein said external electrode is provided so that a portion thereof is disposed in opposing relation to said exit location.

20 6. A medical pad as recited in Claims 2, further comprising:

an insulator surrounding said electrical connector through said fluid containing layer.

7. A medical pad as recited in Claim 1, wherein said electrode is one of a group consisting of:

25 an electrosurgical return electrode;

a defibrillation electrode;  
an electrocardiogram electrode; and,  
a pacing electrode.

8. A medical pad as recited in Claim 1, further comprising:  
5 a plurality of different electrodes interconnected to said fluid circulation layer on  
said first side thereof at locations selected in relation to corresponding functions thereof.

9. A medical pad as recited in Claim 1, further comprising:  
10 an adhesive surface, extending over at least a portion of said first side of said fluid  
circulation layer, for contacting a patient.

10. A medical pad as recited in Claim 9, wherein said adhesive surface  
substantially covers said external electrode.

11. A medical pad as recited in Claim 9, further comprising:  
15 a conformable layer disposed on said first side of said fluid containing layer, said  
conformable layer being thermally and electrically conductive, and said conformable  
layer defining said adhesive surface.

12. A medical pad as recited in Claim 11, a conformable layer comprising:  
a first material suspended in a matrix defined by a second material.

13. A medical pad as recited in Claim 12, wherein said first material  
comprises a liquid and said second material comprises a polymer.

20 14. A medical as recited in Claim 13, wherein said liquid further comprises an  
electrolyte.

15. A medical pad as recited in Claim 11, wherein said conformable layer  
comprises a hydrogel material.

25 16. A medical pad as recited in Claim 11, wherein said external electrode is  
located between said conformable layer and said fluid circulation layer.

17. A medical pad as recited in Claim 16, wherein said electrode is of a plate-like configuration.

18. A medical pad as recited in Claim 16, wherein said conformable layer covers, surrounds and extends laterally away from said external electrode.

19. A medical pad comprising:

a fluid containing layer for containing a thermal exchange fluid circulated therethrough, wherein said medical pad is operable for thermal exchange with a patient through a first side of said fluid containing layer;

5 a conformable layer disposed on said first side of said fluid containing layer, said conformable layer being thermally and electrically conductive and having an adhesive surface for engaging a patient; and,

10 an external electrode, captured between said fluid containing layer and said conformable layer, for receiving electrical energy from a patient through said conformable layer.

20. A medical pad as recited in Claim 19, wherein said conformable layer covers, surrounds and extends laterally away from said external electrode.

21. A medical pad as recited in Claim 20, wherein said external electrode is one of a group consisting of:

15 an electrosurgical return electrode;  
a defibrillation electrode;  
an electrocardiogram electrode; and,  
a pacing electrode.

22. A medical pad as recited in Claim 21, wherein said conformable layer  
20 comprises a hydrogel material.

23. A medical pad as recited in Claim 22, wherein said hydrogel material includes an electrolyte.

24. A medical pad as recited in Claim 23, wherein said electrolyte is selected from a group consisting of:

25 magnesium chloride;  
sodium chloride;

ammonium acetate;  
magnesium acetate; and,  
magnesium sulfate.

25. A medical pad as recited in Claim 19, further comprising:

5       an electrical connector electrically connected to said external electrode and  
extending through said fluid containing layer to an exposed second side thereof; and,  
an insulator surrounding said electrical connector through said fluid containing  
layer.

26. A medical pad as recited in Claim 25, said electrical connector  
10 comprising:

a port for electrical connection to a signal cable.